

REMARKS

Claim 3 is amended to recite “the substrate is rotated at a rotation speed of 400 rpm to 1000 rpm during a period from the beginning of the supply of the dye solution to the end of the supply of the dye solution” as supported, for example, on page 13 of the specification.

New claim 14 depends from amended claim 3 and recites “the concentration of the dye solution is from 0.6 to 0.8 % by mass.” Support can be found, for example, in the paragraph bridging pages 20 and 21 of the specification.

I. Response to Claim Rejection Under 35 U.S.C. § 103

Claims 3-5, 7-11 and 13 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Arioka (U.S. Publication No. 2002/0037366) and Shiau et al (U.S. Patent No. 5,985,363).

Applicant respectfully submits that the cited references do not teach or suggest the presently claimed invention.

Without conceding the merits of the merits of the rejection, independent claim 3 is amended herein to recite that the substrate is rotated at a rotation speed of 400 rpm to 1000 rpm during a period from the beginning of the supply of the dye solution to the end of the supply of the dye solution, which is not taught or suggested by the cited references, whether taken alone or in combination.

In lines 1 to 9 of paragraph [0039], Arioka merely mentions that the substrate may be either stationary or turning when the coating solution is dropped through the discharge nozzle

onto the substrate and then is turned at a high speed to remove the unnecessary solution, but does not mention a specific speed at either stage.

Regarding the single dispensation method disclosed in Shiau et al, Shiau et al only discloses the significance of the process in which the photoresist solution is dispensed on the wafer with a wafer rotation speed of 1,500 to 2,500 rpm, and then the rotation speed of the wafer is maintained at 1,000 to 1,500 rpm, and finally the wafer is rotated at 3,000 to 5,000 rpm. Thus, Shiau et al at best suggests a technique wherein the dye solution is dispensed on the substrate while rotating the substrate at 1,500 to 2,500 rpm and then the rotation speed of the substrate is maintained at 1,000 to 1,500 rpm and finally the substrate is rotated as a speed of 3,000 to 5,000 rpm.

Accordingly, the combination of Arioka and Shiau et al suggests at best a technique in which a dye solution is dispensed on the substrate while rotating the substrate at 1,500 to 2,500 rpm, and then the rotation speed of the substrate is maintained at 1,000 to 1,500 rpm, and finally the substrate is rotated at 3,000 to 5,000 rpm.

As clarified in amended claim 3, the dye solution in the present invention is applied while the substrate is rotated at a rotation speed of 400 to 1000 rpm. Then, the rotation speed is decreased. Accordingly, the range of the rotation speed at the time of applying the dye solution in the invention does not overlap the range of Shiau et al (1,500 to 2,500 rpm), and the range of the rotation speed during the low-speed rotation step is also different from that of Shiau et al. Accordingly, the presently claimed process is clearly different from that obtained by the

combination of Arioka and Shiau et al. Thus, even if motivated to combine the references (a point Applicant does not concede), the present invention would not have been achieved.

Additionally, the feature of claim 7 of the present application, which relates to the rotation speed of the substrate in the low-speed rotation step, is not taught by the combination of Arioka and Shiau et al. For this additional reason the subject matter of claim 7 is not rendered obvious by the cited references, whether taken alone or in combination.

Further, neither of Arioka nor Shiau et al specifically suggests the effects that can be achieved by the presently claimed invention.

With respect to the concentration of the dye solution, Arioka discloses, in the working examples, that the dye solution having a concentration of 5 % by mass is used (see paragraph [0047] of Arioka). Although the soaking solution is changed in Examples 2-5 of Arioka, the coating solution used is the same. On the other hand, Shiau et al does not specifically describe the concentration of the photoresist solution. Accordingly, the combination of Arioka and Shiau et al at most teaches the application of a dye solution having a concentration of 5 % by mass by the process described in Shiau et al. The concentration of dye defined in claim 5 of the present application is much lower than the concentration described above, and is neither taught nor suggested by the combination of Arioka and Shiau et al. Thus, for this additional reason, the cited references do not render obvious the subject matter of claim 5.

In conclusion, the present invention achieves uniformity of the dye layer by adopting a process that does not overlap the process taught by the combination of Arioka and Shiau et al.

The effects of the present invention are clarified by the comparison between the Examples and Comparative Examples described in the specification of the present application.

Accordingly, Applicant respectfully requests withdrawal of the rejection.

II. New Claim 14

New claim 14 depends from amended claim 3 and is patentable for at least the same reasons. New claim 14 relates to the concentration of the dye solution of from 0.6 to 0.8% by mass, which is not taught for suggested by either of the cited references. Further, the cited references do not recognize the advantageous effects of the present invention related to the concentration of the dye solution as discussed above. Thus, for these additional reasons, the cited references do not render obvious the subject matter of new claim 14.

III. Conclusion

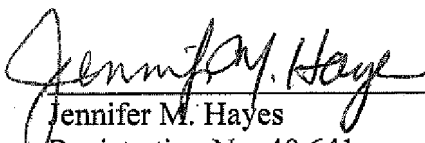
In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.114(c)
Appln. No. 10/722,123

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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